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Stuff Lending System

CLASSES AND ATTRIBUTES ANALYSIS

1. **Member:** The primary participants in the system are the members. They sign up, borrow and lend items, and manage their profiles. Credits play a key role, as they are accumulated and used within the system. Each member is uniquely identified by their member ID.
   - **Attributes:** username, password, member ID, email, phone number, credits.

2. **Item:** Items are the key assets traded within the system. Every item is owned by a member and can be loaned to others. To ensure proper availability and lending, both status and ownership need to be monitored.
   - **Attributes:** item ID, name, owner, category, description, status(borrowed/available).

3. **System administrator:** oversees the entire system and handles key tasks like updating the day count and managing member records.
   - **Attributes:** admin ID, name, email, password, phone number.

4. **Lending contract:** A contract outlines the borrowing agreement between two members, including details about the item, the credit exchange, and how long it can be borrowed. This helps the system keep track of who has the item, when it's due back, and how much credit was used.
   - **Attributes:** contract ID, item ID, borrower ID, lender ID, borrow date, return date, status, credit amount.

5. **Day counter:** to keep track of time in the system, which is important for managing loans, checking due dates, and supporting other time-related tasks.
   - **Attributes:** current day, start date, last updated.

RELATIONSHIPS ANALYSIS

1. **Member to item (one to many):** Each member can own multiple items, but each item is owned by only one member at a time.

2. **Member to lending contract (one to many):** A member can have multiple lending contracts, and each contract involves one member as either the borrower or the lender

3. **Lending contract to item (one to many):** Each lending contract can involve multiple items, but each item can only be part of one active contract at a time.

4. **System administrator to item, member (one to many):** A system administrator can manage many items and members, but each item and member is overseen by just one administrator.

5. **System administrator to lending contract (one to many):** Each administrator can handle multiple lending contracts, but each contract is managed by only one administrator.

DOMAIN MODEL DESIGN

```
                    ┌─────────────────┐
                    │     Member      │
     Initiates    1 ├─────────────────┤ 1   Borrows
  ┌─────────────────┤                 ├─────────────────┐
  │                 └─────────────────┘                 │
  │                                                     │
  │                                                     │
  *│                                                   *│
┌─────────────────┐      Is included in      ┌─────────────────┐
│    Contract     │                        1 │      Item       │
├─────────────────┤ *                        ├─────────────────┤
│ + lendingDate: Date │────────────────────│ + lendingCost: int │
└─────────────────┘                          └─────────────────┘
```